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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,474	01/29/2004	Steven T. Fink	071469-0307596 (PC0155A)	3726
69792 7590 06/12/2007 TOKYO ELECTRON U.S. HOLDINGS, INC. 4350 W. CHANDLER BLVD. SUITE 10 CHANDLER, AZ 85226			EXAMINER LAFOND, RONALD D	
			ART UNIT 1709	PAPER NUMBER
			MAIL DATE 06/12/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/766,474	FINK, STEVEN T.	
	Examiner	Art Unit	
	Ronald D. Lafond	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 13-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/29/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1709

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species A, Claims 1 – 12, in the reply filed on May 15, 2007, is acknowledged. Claims 13 – 31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "substantially similar" in claim 3 is a relative term which renders the claim indefinite. The term "substantially similar" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For the purposes of examining this claim on the merits, the term "substantially similar" will be construed by the Examiner as meaning either the same material (i.e., a silicon oxide film for a process in which silicon oxide is to be etched) or containing at least one element in common (i.e. a silicon film for a process in which silicon oxide is to be etched or deposited).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1709

5. Claims 1, 2, 4 – 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda, et al (United States Patent Application Publication US 2002/0005252 A1, hereafter Masuda) in view of Wong, et al (United States Patent 5,522,932, hereafter Wong).

6. Regarding Claim 1, Masuda teaches a method for manufacturing a substrate with a plasma processing system, the method comprising: disposing a substrate on a chuck in the plasma processing chamber; and forming a plasma in a processing region within the plasma processing chamber (see Paragraph [0057] of Masuda).

7. Masuda does not teach the steps of the method comprising: obtaining a component of a plasma processing system which has been coated with a film of material; and disposing said component in a plasma processing chamber, said component having been coated outside of said plasma processing chamber. However, Masuda does teach that it is advantageous to perform an in situ pre-seasoning/pre-coating process to prevent corrosion of the interior surface of the apparatus from the plasma etchants (see Paragraph [0032], "According to the present invention, a part of processing gas is polymerized by plasma discharge and a surface coating layer is formed by polymer on the part of the inner wall of the processing chamber which is in contact with plasma or the surface of the part ... Therefore the inner wall surface will not be etched and consumed by plasma, so that the frequency of part exchange of the inner wall surface can be reduced and the running cost can be decreased") before the substrate processing. Furthermore, Wong teaches that plasma processing apparatus components may be coated with corrosion-resistant materials outside of the plasma processing chamber and then disposed therein (see Column 6, lines 19 – 33). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the method taught by Masuda by coating the plasma processing apparatus parts outside of the chamber and then reassembling them inside the chamber as taught by Wong (instead of performing an in situ coating step within the chamber as taught by Masuda) with a reasonable expectation of success, because both references teach performing a pre-coating process on apparatus parts that have surfaces exposed to plasma during processing to prevent corrosion.

Art Unit: 1709

8. Regarding Claim 2, Wong inherently teaches the method wherein the obtaining includes obtaining a component from one of a component manufacturer and plasma processing chamber manufacturer, as all such components must come from such a manufacturer.

9. Regarding Claims 4 and 5, Masuda does not teach the method wherein the film of material has been coated [in] a second plasma processing chamber different from said plasma processing chamber, or wherein the plasma processing chamber used to coat the component is similar to the plasma processing chamber where the substrate is disposed. However, as discussed, Wong teaches that corrosion-resistant coatings on the surfaces of plasma apparatus parts exposed to plasma need not be applied in situ, and may, in fact, be successfully applied before apparatus assembly or re-assembly. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the method taught by Masuda and Wong by instead performing the pre-coating method taught by Masuda on apparatus parts in a different chamber and then disposing of and reassembling them back in the original chamber before substrate processing as taught by Wong with a reasonable expectation of success.

10. Regarding Claims 6 – 8, Masuda inherently teaches the method wherein the film material, film thickness, and film uniformity are determined by a customer specification, as the film deposited must necessarily be of a specification desired by the customer or user.

11. Regarding Claim 11, Masuda teaches the method, further comprising pumping excess gas through a pump opening arranged in the plasma processing chamber (see Paragraph [0057]).

12. Claims 3, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda in view of Wong, and further in view of Williams, et al (United States Patent 5,647,953, hereafter Williams).

13. Regarding Claims 3 and 10, Masuda in view of Wong does not teach the method wherein the film of material coated on the component comprises a material that is substantially similar to the substrate material, or wherein the film of material comprises silicon dioxide for a silicon substrate. However, Williams teaches just such a limitation, wherein the interior surface of a plasma processing apparatus is pre-coated with SiO₂ before the processing of silicon substrates (see Column 5, lines 34 – 67, and Column 6, lines 1 – 23). Williams also teaches, in Column 4, lines 25 – 31, that “a silicon dioxide coating applied on the interior surfaces of the chamber adhere[s] loose particles to the interior surfaces,” which

Art Unit: 1709

prevents "adverse [effects on] subsequent substrate processing in the reactor" (see Column 2, lines 65 – 67, and Column 3, lines 1 – 4), particle contamination, and reduction in reactor performance. Therefore, it would have been obvious to one having ordinary skill in the art to have modified the method taught by Masuda in view of Wong by using a film material which is substantially similar to the substrate material, i.e. by using a film of SiO₂ for silicon substrates, with a reasonable expectation of success and to obtain these advantages, wherein particle contamination is reduced and reactor performance is not.

14. Regarding Claim 9, Williams teaches that the silica film has a thickness of 0.2 – 2 microns (see Column 4, lines 49 – 51 of Williams).

15. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda in view of Wong, and further in view of Shan, et al (United States Patent 5,605,637, hereafter Shan).

16. Masuda in view of Wong does not teach the method for manufacturing a substrate with a plasma processing system as recited in Claim 11, wherein: the obtaining includes obtaining a pumping deposition shield that has been coated with a film of material; and the component disposing includes disposing said pumping deposition shield in the pump opening. As discussed, Masuda in view of Wong teaches that it is advantageous to apply a pre-coating to components and surfaces of the plasma processing apparatus which come into contact with the plasma during processing. Masuda in view of Wong further teaches that it is possible to coat the individual components in a separate processing chamber before reinstalling them back in the chamber to used for substrate processing instead of performing an in site chamber pre-coating process. Shan teaches, in Column 2, lines 27 – 38, that it is advantageous to use a pumping-deposition shield "to prevent the plasma from reaching a portion of the reactor chamber." Shan further teaches, in Column 6, lines 14 – 22, that "the invention provides a simple yet highly effective technique for reducing dc bias in a plasma etch reactor to a predicted lower level than would be obtained without use of the invention. Thus, higher etch rates can be maintained without the wafer damage and other processing difficulties that ensue from use of a dc bias that is too high." It would have been obvious to one having ordinary skill in the art to have modified the method taught by Masuda in view of Wong by including a pump deposition shield in the plasma processing apparatus to have obtained the advantages taught by Williams. Furthermore, because one surface of the pumping deposition shield is in fluid contact with the

Art Unit: 1709

plasma (see Figure 1 of Wong), and the pumping deposition shield functions to prevent plasma from entering the outlet ports for evacuating gases from the chamber, it would have been obvious to one having ordinary skill in the art to have coated the pumping deposition shield taught by Williams with a film of material as taught by Masuda and Wong to have obtained the advantages disclosed by Masuda and Wong, i.e. to prevent corrosion of the pumping deposition shield.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald D. Lafond whose telephone number is (571) 270-1878. The examiner can normally be reached on M-F 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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